

## **C-08: Study of various types of constructions for building regulating courses in road rehabilitation**

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In road rehabilitation, road surfaces can be corrected by constructing regulating courses using various types of construction methods and materials. A research project was carried out in 1991 to find out the most economical and suitable method of construction for various thicknesses of such courses for 4 such methods. A section of 800m length was selected on Katubedda - Piliyandala Road upto University of Moratuwa for this work on a trial basis.

The following regulating courses were tried out as per Standard Specification for Construction and Maintenance of Roads and Bridges SSCM). These sections were selected in places where the thicknesses (t) of regulating courses were within a particular range as indicated within brackets for various constructions.

1. Dense Graded Aggregate Base (DGAB) using 37.5mm graded aggregate followed by a prime coat ( $t > 75\text{mm}$ ).
2. Single sized Aggregate Base (SSAB) using 37.5 mm aggregate followed by a first coat bituminous emulsion surfacing ( $t = 50$  to  $75\text{mm}$ )
3. Penetration Macadam Base(PMB) using 37.5mm coarse aggregate and 12.5mm key aggregate ( $t = 50$  to  $75\text{mm}$ ).
4. Cold Mix regulating course of nominal maximum size of 19mm using Cutback Bitumen (CM) ( $t < 50\text{mm}$ ).

After the construction of the above, a surfacing of Single Bituminous Surface Treatment (SBST) was carried out by using 12.5mm aggregate and covered by a sand seal for the full length of the project.

The behaviour, advantages and disadvantages of each type of construction is given in the next page.

1. DGAB followed by a prime coat: All corrugations and depressions could be corrected easily and thereby a smooth finished surface was achieved. The main disadvantage is that the section with this material cannot be opened for traffic without the prior application of a surface dressing.
2. SSAB followed by a first coat: The section can be opened for traffic after the application of the first coat. Wherever the thicknesses of correction were uniform it was easy to achieve the required final level.
3. PMB: The section can be opened for traffic after 4h. Here too, it was easy to achieve the required final level in places where the thicknesses were uniform.
4. CM: This material is very easy to work with and traffic can be allowed immediately after construction.

**Table 1. Relative cost of the various types of constructions**

<i>Type of Construction</i>	<i>Rate/m<sup>2</sup>/75mm thickness Rs.</i>
1. DGAB and priming	214.55
2. SSAV and first coat	227,70
3. PMB	366.95
4. CM	472.95

*Table 1* gives relative cost/m<sup>2</sup>/75mm thickness for various types of constructions including the cost of SBST and sand seal built over them.

All 4 types of correction courses were constructed successfully with the advantages and disadvantages as given.

From the cost considerations, it can be stated that out of the 4 regulating courses, the cold mix is the most expensive closely followed by the Penetration Macadam Base. The dense graded aggregate base covered by

prime coat is the cheapest regulating course. The single sized aggregate base using 37.5mm coarse aggregate covered by first bituminous emulsion surfacing is the next cheapest regulating course. Both the cheapest types are less than half the most expensive type using cold mix.